

PRELIMINARY AMENDMENT

Sir:

Please preliminarily amend the above-referenced application as follows:

In the Specification:

Please replace paragraph beginning at line 23 of page 1 with the following rewritten paragraph:

Both the circuit switched and the packet switched services can be used for communicating packet data. Packet data services can be defined in general as services that are capable of transporting data units (data packets or similar data entities of fixed or variable length) between two signalling points, such as between two terminals or other nodes of the communication system. In this specification the term data network refers to any network that is capable of transporting data between two or more nodes. The data network may be any communication network and may be based on use of a fixed line or wireless communication media.

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Please replace the paragraph beginning at line 22 of page 3 with the following rewritten paragraph:

A prior art solution for the 3rd party service provision is based on use of the so called Parlay model. The Parlay model is based on specifications by the Parlay Group. The Parlay Group is a non-profitable consortium. The Parlay Group is an organisation that has been formed to make creation of communication applications by specifying and promoting open Application Programming Interfaces (APIs) which may be used for intimately link different telecommunications applications. A parlay framework shall be understood to refer to a collection of APIs that are employed to support authentication and service discovery procedures between the client willing to use the service and the service provider.

Please replace paragraph beginning at line 21 of page 4, through line 8 of page 5 with the following rewritten paragraph:

It has been suggested that open interfaces that are based on distributed object techniques could be used for the service provisioning. The open interfaces could be based on the CORBA (common object request broker architecture) data transportation standard. In accordance with the CORBA the network protocols used by the carrier network are not necessarily visible for the external service providers. Thus the value added service providers may use the open interfaces for the service provisioning. For example, in the current intelligent network (IN) architecture for mobile communication, the interface between the network controller and an external service control point (SCP) may be based on a protocol

such as the intelligent network application protocol (INAP) or the customised applications for mobile network enhanced logic (CAMEL) application part (CAP) protocol. If the open CORBA (common object request broker architecture) interface is employed, the CORBA interface will hide the INAP or CAP protocol from the external service providers. The interfaces need to be defined for each service by the operator. The interfaces must also be mapped to the interface protocol (e.g. INAP).

Please replace the paragraph beginning at line 13 of page 8 with the following rewritten paragraph:

The embodiments of the invention may enable network operators to provide multiple advanced services. The network operators may be enabled to more easily provide a wide variety of different and even competing services without being required to generate and/or maintain these services. The network operators may choose to buy and host any number of services which are available from the external service providers and which the operators consider to be worth offering. The external service providers may be enabled to more freely create and innovate new services and to offer these new services for the network operators. In addition, the network operators may use external services for connection management operations such as charging and intelligent network services. In addition, the embodiments may provide a secure way to access services that are provided by external service providers.

Please replace the paragraph beginning at line 1 of page 9 with the following rewritten paragraph:

For better understanding of the present invention, and how the invention can be put into effect, reference will now be made by way of example to the accompanying drawings in which:

Figure 1 shows one embodiment of the present invention;

Figure 2 is a flowchart illustrating the operation of one embodiment of the present invention; and

Figure 3 is an illustration of a possible service list that includes three services.

Please replace the paragraph beginning at line 10 of page 9 with the following rewritten paragraph:

Figure 1 shows a data communication network 1 that is run by a network operator. It shall be understood that the operator cannot typically be represented as any specific entity of the network but is rather to be understood to be an entity or organization that has the overall management responsibility of the network. The operator typically is the organisation or similar entity owning the network apparatus and selling access rights to the end users.

Please replace the paragraph beginning at line 24 of page 9 with the following rewritten paragraph:

The embodiments are based on a concept that enables a network operator to contract services from a 3rd party i.e. external value added service providers (VASPs) 11 to 13. The 3rd party value added service providers (VASPs) 11 to 13 may be entities such as application service providers (ASP) and organisations such as private companies or public authorities. The private companies may be organisations such as banks, insurance companies or any other instances capable and willing to offer services to clients.

Please replace the paragraph beginning at line 16 of page 11 with the following rewritten paragraph:

The inventors have found that it is possible to use session initiation protocol type signalling for the creation of the necessary interfaces towards the external service providers instead e.g. of using a transport protocol, such as the CORBA, for this purpose. An advantage of using a session initiation protocol instead of a transport protocol is that no predefined information regarding the interfaces is required at this stage but the interfaces may be created based on information signalled between the client and the service. For example, in the CORBA protocol the designer of a new service has to know the interface definitions beforehand, i.e. at the time of creating the new service.

Please replace the paragraph beginning at line 29 of page 11 through line 5 of page 12 with the following rewritten paragraph:

The use of session initiation protocol may thus facilitate a more flexible and faster provision of new services since it is not necessary to define and/or map the interface beforehand. The session initiation protocol is advantageous also in that by means of it, it is possible to establish a point-to-point like connection for a connectionless packet switched communication after the message has been received at the receiving end of the signalling. The message may define all necessary interfaces and/or protocol required for the connection.

Please replace the paragraph beginning at line 7 of page 12 with the following rewritten paragraph:

Since it is possible to transport any necessary information by means of the session initiation protocol messaging, the embodiments also enable conversion of a 3rd party service to be suitable for use in a particular carrier network which may have some specific requirements. By means of this, a value added service provider may offer the same value added service to different operators running differently designed networks.

Please replace the paragraph beginning at line 5 of page 14 with the following rewritten paragraph:

According to a possibility, the framework may use a register function provided by the session initiation protocol (SIP) to enable the 3rd party service providers to advertise themselves to the operator network. Security and authentication functions provided by the session initiation protocol may also be used. The session initiation protocol (SIP) message

register may be physically located e.g. in the interface entity or framework 2. However, the register may also be provided elsewhere in the system, such as in the proxy server 6.

Please replace the paragraph beginning at line 28 of page 14 through line 3 of page 15 with the following rewritten paragraph:

The operator is enabled to sign an agreement regarding the services. Billing and charging interfaces can be provided between the external service providers and the network. The billing and charging interfaces may be utilised when a service usage agreement is signed.

More particularly, the billing and charging interfaces are arranged such that they enable the external, i.e. 3rd party service providers and service users, to make contracts regarding e.g. the price of the service usage, conditions and/or required certifications.

Please replace the paragraph beginning at line 22 of page 16 with the following rewritten paragraph:

When an application user or another client wishes to use a service on the list, the user initiates the use by routing a service request to the framework 2. The request is processed so as to find a matching registered service that is offered by a 3rd party service provider. When a matching service is found, a service agreement (billing and charging) may be signed with the framework operator or alternatively directly with the 3rd party provider, depending upon the application. The request (e.g. a SIP message) is then routed to the 3rd party application server.

Please replace the paragraph beginning at line 1 of page 17 with the following rewritten paragraph:

When a user of an application wants to use a service provided by an external service provider, a SIP message may be first routed to a proxy server 6 of the framework. In this case the framework proxy serve 6 processes the SIP message and looks for an appropriate 3rd party service provider. After an appropriate provider is found, the proxy server 6 may contact the service provider. The message may be forwarded directly to the service provider. The message may also be forwarded to a proxy server of the 3rd party service provider. The proxy server can be used to provide firewall and/or gateway functions and to open a route through a firewall.

Please replace the paragraph beginning at line 21 of page 17 with the following rewritten paragraph:

The step of finding a matching service is initiated by a request from a client for a service. The request may include an identity for the requested service or the request may specify properties for a desired service, such as purpose and/or price of the service and so on. Thus the matching of the client request to the registered services can be for service identity or for service properties, or even both, if several alternative services exist with the same identity.

Please replace the paragraph beginning at line 30 of page 17 through line 5 of page 18 with the following rewritten paragraph:

When the matching has been performed, there exist several options with respect to how the client may use the service. In the simplest case there is one request from the client to the service provider (maybe via the framework, i.e. framework 2 or framework proxy 6). An application may be executed in the service provider entity (i.e. one of the service providers 11 to 13) and a response is provided to the client from the service provider entity. The response may be communicated via the network.

Please replace the paragraph beginning at line 7 of page 18 with the following rewritten paragraph:

In more complicated cases an association can be defined between the client and the service obtained by the step of finding a matching service. The association means that the client or the service can later on initiate a service session between the client and the service (within the service provider entity without the need for the step of finding a matching service).

Please replace the paragraph beginning at line 15 of page 18 with the following rewritten paragraph:

The service association can be defined, for instance, so that a service reference to the service is stored by the client. By means of this the client may contact directly the service without the need for finding the service by the matching operations. Despite this, the contacting operations may be performed via the framework.

Please replace the paragraph beginning at line 1 of page 19 with the following rewritten paragraph:

The processing of the service advertisement, agreements, service registry, authentication and service requests may be implemented by means of an external service provision function provided in the framework. The function may be provided by means of a service controller entity provided in the core network side of a mobile communication network. The service controller entity may be provided by means of the above referred SIP framework 2 or proxy server 6.

Please replace the paragraph beginning at line 4 of page 20 with the following rewritten paragraph:

For example, at least a part of the messaging may be based on use of the HyperText Transfer Protocol (HTTP) or the simple Object Activation Protocol (SOAP). From these two examples the HTTP is a protocol known from the IP based networks. The format of the HTTP messages is based on HyperText Markup Language (HTML). The SOAP is a protocol that uses typed serialisation format. The SOAP uses HTTP for the transportation of its request/response messaging. The SOAP message format is based on Extensible Markup language XML. The SOAP was initially intended for use in the object Remote Procedure Call (RCP) technologies like CORBA or COM.

In the Claims:

Claims 5, 16 and 20 have been amended as follows:

1 5. (Amended) A method as claimed in claim 1, wherein the at least one external
2 service provider offers the services based on said protocol.

1 16. (Amended) A method as claimed in claim 1, wherein a service discovery
2 interface of the interface entity monitors for offers by the at least one external service
3 provider.

1 20. (Amended) A method as claimed in claim 1, wherein the offers by the at least
2 one external service provider are registered in a register function.

Sentence at line 1 of page 22 has been amended as follows:

--What is claimed is:--

In the Abstract:

5 Paragraph beginning at line 1 of page 28 has been amended as follows:

--Abstract of the Disclosure

A method and arrangement for providing services for clients (3) associated with a data
communication network is disclosed for use in a system where the services are provided by
at least one external service provider (11 - 13). Offers are signalled from at least one
10 external service provider to an interface entity (2) associated with the data network (1), the
offers associated with services provided by the service provider. The offers are processed at
the interface entity in order to make a decision regarding the acceptance of the offers.
Accepted services are then included into a register of services that are available for the

clients. When a client wishes to use a service, a request for the service is signalled to the interface entity. The request is processed by the interface entity to find a matching service from the registered services. If found, the requested service is provided by an external service provider providing the service.--

Remarks

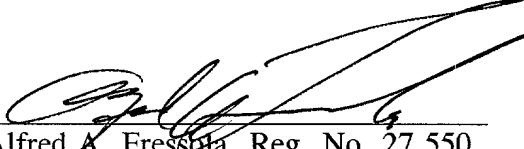
This preliminary amendment is filed for the purpose of placing the application into standard U.S. format. Claims 5, 16 and 20 have been amended. Consideration and allowance of the claims is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Respectfully submitted,

Date:

12/20/01



Alfred A. Fressola, Reg. No. 27,550
Ware, Fressola, Van Der Sluys
& Adolphson LLP
Bradford Green, Building Five
755 Main Street, PO Box 224
Monroe, CT 06468
(203) 261-1234

VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the Specification:**

Paragraph beginning at line 23 of page 1 has been amended as follows:

Both [of] the circuit switched and the packet switched services can be used for communicating packet data. Packet data services can be defined in general as services that are capable of transporting data units (data packets or similar data entities of fixed or variable length) between two signalling points, such as between two terminals or other nodes of the communication system. In this specification the term data network refers to any network that is capable of transporting data between two or more nodes. The data network may be any communication network and may be based on use of a fixed line or wireless communication media.

Paragraph beginning at line 22 of page 3 has been amended as follows:

A prior art solution for the 3rd party service provision is based on use of the so called Parlay model. The Parlay model is based on specifications by the Parlay Group. The Parlay Group is a non-profitable consortium. The Parlay Group is an organisation that has been formed to make creation of communication applications by specifying and promoting open Application Programming Interfaces (APIs) which may be used for intimately link different telecommunications applications. A parlay framework shall be understood to refer to a

collection of APIs that are employed to support authentication and service discovery procedures between the client willing to use the service and the service provider.

Paragraph beginning at line 21 of page 4, through line 8 of page 5 has been amended as follows:

It has been suggested that open interfaces that are based on distributed object techniques could be used for the service provisioning. The open interfaces could be based on the CORBA (common object request broker architecture) data transportation standard. In accordance with the CORBA the network protocols used by the carrier network are not necessarily visible for the external service providers. Thus the value added service providers may use the open interfaces for the service provisioning. For example, in the current intelligent network (IN) architecture for mobile communication, the interface between the network controller and an external service control point (SCP) may be based on a protocol such as the intelligent network application protocol (INAP) or the customised applications for mobile network enhanced logic (CAMEL) application part (CAP) protocol. If the open CORBA (common object request broker architecture) interface is employed, the CORBA interface will hide the INAP or CAP protocol from the external service providers. The interfaces need to be defined for each service by the operator. The interfaces must also be mapped to the interface protocol (e.g. INAP).

Paragraph beginning at line 13 of page 8 has been amended as follows:

The embodiments of the invention may enable network operators to provide multiple advanced services. The network operators may be enabled to more easily provide a wide variety of different and even competing services without being required to generate and/or maintain these services. The network operators may choose to buy and host any number of services which are available from the external service providers and which the operators consider to be worth offering. The external service providers may be enabled to more freely [to] create and innovate new services and to offer these new services for the network operators. In addition, the network operators may use external services for connection management operations such as charging and intelligent network services. In addition, the embodiments may provide a secure way to access services that are provided by external service providers.

Paragraph beginning at line 1 of page 9 has been amended as follows:

For better understanding of the present invention, and how the invention can be put into effect, reference will now be made by way of example to the accompanying drawings in which:

Figure 1 shows one embodiment of the present invention; [and]

Figure 2 is a flowchart illustrating the operation of one embodiment of the present invention[.]; and

Figure 3 is an illustration of a possible service list that includes three services.

Paragraph beginning at line 10 of page 9 has been amended as follows:

Figure 1 shows a data communication network 1 that is run by a network operator. It shall be understood that the operator cannot typically be represented as [an] any specific entity of the network but is rather to be understood to be an entity or organization that has the overall management responsibility of the network. The operator typically is the organisation or similar entity owning the network apparatus and selling access rights to the end users.

Paragraph beginning at line 24 of page 9 has been amended as follows:

The embodiments are based on a concept that enables a network operator to contract services from a 3rd party i.e. external value added service providers (VASPs) 11 to 13. The 3rd party value added service providers (VASPs) 11 to 13 may be entities such as application service providers (ASP) and organisations such as private companies or public authorities. The private companies may be organisations such as banks, insurance companies or any other instances capable and willing to offer services to clients.

Paragraph beginning at line 16 of page 11 has been amended as follows:

The inventors have found that it is possible to use session initiation protocol type signalling for the creation of the necessary interfaces towards the external service providers instead e.g. of using a transport protocol, such as the CORBA, for this purpose. An advantage of using a session initiation protocol instead of a transport protocol is that no predefined information regarding the interfaces is required at this stage but the interfaces may be created based on

information signalled between the client and the service. For example, in the CORBA protocol the designer of a new service has to know the interface definitions beforehand, i.e. at the time of creating the new service.

- 5 Paragraph beginning at line 29 of page 11 through line 5 of page 12 has been amended as follows:

10 The use of session initiation protocol may thus facilitate a more flexible and faster provision of new services since it is not necessary to define and/or map the interface beforehand. The session initiation protocol is advantageous also in that by means of it, it is possible to establish a point-to-point like connection for a connectionless packet switched communication after the message has been received at the receiving end of the signalling. The message may define all necessary interfaces and/or protocol required for the connection.

- 15 Paragraph beginning at line 7 of page 12 has been amended as follows:

Since it is possible to transport any necessary information by means of the session initiation protocol messaging, the embodiments also enable conversion of a 3rd party service to be suitable for use in a particular carrier network which may have some specific requirements. By means of this, a value added service provider may offer the same value added service to different operators running differently designed networks.

20

Paragraph beginning at line 5 of page 14 has been amended as follows:

According to a possibility, the framework may use a register function provided by the session initiation protocol (SIP) to enable the 3rd party service providers to advertise themselves to the operator network. Security and authentication functions provided by the session initiation protocol may also be used. The session initiation protocol (SIP) message register may be physically located e.g. in the interface entity or framework 2. However, the register may also be provided elsewhere in the system, such as in the proxy server 6.

Paragraph beginning at line 28 of page 14 through line 3 of page 15 has been amended as follows:

The operator is enabled to sign an agreement regarding the services. Billing [&] and charging interfaces can be provided between the external service providers and the network. The billing and charging interfaces may be utilised when a service usage agreement is signed. More particularly, the billing and charging interfaces are arranged such that they enable the external, i.e. 3rd party service providers and service users, to make contracts regarding e.g. the price of the service usage, conditions and/or required certifications.

Paragraph beginning at line 22 of page 16 has been amended as follows:

When an application user or another client wishes to use a service on the list, the user initiates the use by routing a service request to the framework 2. The request is processed so as to find a matching registered service that is offered by a 3rd party service provider. When a matching service is found, a service agreement (billing and charging) may be signed with

the framework operator or alternatively directly with the 3rd party provider, depending upon the application. The request (e.g. a SIP message) is then routed to the 3rd party application server.

5 Paragraph beginning at line 1 of page 17 has been amended as follows:

When a user of an application wants to use a service provided by an external service provider, a SIP message may be first routed to a proxy server 6 of the framework. In this case the framework proxy serve 6 processes the SIP message and looks for an appropriate 3rd party service provider. After an appropriate provider is found, the proxy server 6 may contact the service provider. The message may be forwarded directly to the service provider. The message may also be forwarded to a proxy server of the 3rd party service provider. The proxy server can be used to provide firewall and/or gateway functions and to open a route through a firewall.

15 Paragraph beginning at line 21 of page 17 has been amended as follows:

The step of finding a matching service is initiated by a request from a client for a service. The request may include an identity for the requested service or the request may specify properties for a desired service, such as purpose and/or price of the service and so on. Thus [said] the matching of the client request to the registered services can be for service identity or for service properties, or even both, if several alternative services exist with the same identity.

Paragraph beginning at line 30 of page 17 through line 5 of page 18 has been amended as follows:

When the matching has been performed, there exist several options [for the manner] with respect to how the client may use the service. In the simplest case there is one request from the client to the service provider (maybe via the framework, i.e. framework 2 or framework proxy 6). An application may be executed in the service provider entity (i.e. one of the service providers 11 to 13) and a response is provided to the client from the service provider entity. The response may be communicated via the network.

Paragraph beginning at line 7 of page 18 has been amended as follows:

In more complicated cases an association can be defined between the client and the service obtained by the step of finding a matching service. The association means that the client or the service can later on initiate a service session between the client and the service (within the service provider entity without the need for the step of finding a matching service).

Paragraph beginning at line 15 of page 18 has been amended as follows:

The service association can be defined, for instance, so that a service reference to the service is stored by the client. By means of this the client may contact directly the service without the need for finding the service by the matching operations. Despite this, the contacting operations may be performed via the framework.

Paragraph beginning at line 1 of page 19 has been amended as follows:

The processing of the service advertisement, agreements, service registry, authentication and service requests may be implemented by means of an external service provision function provided in the framework. The function may be provided by means of a service controller entity provided in the core network side of a mobile communication network. The service controller entity may be [provide] provided by means of the above referred SIP framework 2 or proxy server 6.

Paragraph beginning at line 4 of page 20 has been amended as follows:

For example, at least a part of the messaging may be based on use of the HyperText Transfer Protocol (HTTP) or the simple Object Activation Protocol (SOAP). From these two examples the HTTP is a protocol known from the IP based networks. The format of the HTTP messages is based on HyperText Markup Language (HTML). The SOAP is a protocol that uses typed serialisation format. The SOAP uses HTTP for the transportation of its request/response messaging. The SOAP message format is based on Extensible Markup language XML. The SOAP was initially [indented] intended for use in the object Remote Procedure Call (RCP) technologies like [the] CORBA or COM.

In the Claims:

Claims 5, 16 and 20 have been amended as follows:

1 5. (Amended) A method as claimed in claim 1, wherein the at least one external
2 service [providers] provider offers the services based on said protocol.

1 16. (Amended) A method as claimed in claim 1, wherein a service discovery
2 interface of the interface entity monitors for offers by the at least one external service
3 [providers] provider.

1 20. (Amended) A method as claimed in claim 1, wherein the offers by the at least
2 one external service [providers] provider are registered in a register function.

Sentence at line 1 of page 22 has been amended as follows:

[Claims] What is claimed is:

In the Abstract:

5 Paragraph beginning at line 1 of page 28 has been amended as follows:

Abstract of the Disclosure

10 A method and arrangement for providing services for clients (3) associated with a data
communication network is disclosed for use in a system where the services are provided by
at least one external service provider (11 - 13). [In the method offers] Offers are signalled
from [said] at least one external service provider to an interface entity (2) associated with the
data network (1), [said] the offers [associating] associated with services provided by [said]
the service provider. The offers are processed at the interface entity in order to make a
decision regarding the acceptance of the offers. Accepted services are then included into a
register of services that are available for the clients. When a client wishes to use a service, a

request for the service is signalled to the interface entity. The request is processed by the interface entity to find a matching service from the registered services. If [a matching service is] found, the requested [said] service is [requested from] provided by an external service provider providing [said] the service. [The request is communicated to said external service provider based on an appropriate protocol that enables initiation of a service provisioning session. The protocol is preferably such that the session may be initiated without any beforehand defined interfaces between the interface entity and the external service provider.

(Fig. 1)]